DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention]This invention relates to the electronic equipment which can control the contents of operation mutually to two or more electronic equipment connected by the network for home use, and its control method.

[0002]

[Description of the Prior Art]Conventionally, among apparatus, such as TV (television) and VTR (video cassette recorder) which are called electronic equipment, especially AV equipment, and CD (compact disk) player, there were some which have a function called AV KOMPYU link which enabled control for operating by cooperating mutually. This connects mutual apparatus with a path cord for exclusive use, and controls the apparatus of another side according to the contents of operation of one apparatus.

For example, when the reproduction button of VTR is pushed, TV is turned on and an input is changed to the input video side.

[0003]The specification of the original command set for the AVC command of IEEE1394 to also control various electronic equipment is decided, Using the dedicated software provided with this command set by intelligent apparatus, such as PC (personal computer), and controlling the electronic equipment connected to PC (it had the control terminal) was performed. The electronic equipment controlled here is provided with the control terminal for exclusive use for external apparatus to perform motion control.

[0004]In the software for PC, the Internet dedicated terminal, and TV with an Internet access function. It has the WWW (WorldWide Web) browser which can see the page data written in HTML (HyperText Markup Language) using the HTTP (HyperText Transfer Protcol) protocol, It is widely used for access to the Internet.

[0005]

[Problem(s) to be Solved by the Invention]When it was going to control operation of electronic equipment by the control method of conventional electronic equipment from PC, by it, it was required to perform software for exclusive use for electronic equipment control as a premise. When the interdependent control between the electronic equipment of controlling TV to VTR is considered, TV

needed to memorize the command set for controlling VTR, and when there was much control object equipment, the capacity became huge and was not able to respond to still newer apparatus or the function which increased newly. And in the same kind of electronic equipment, since the same command set (control code) was used, more than one were not able to be used, having connected simultaneously.

[0006]What the browsing function of WWW of the Internet has spread widely as a function of a personal computer, and, on the other hand, has an accessing function to WWW of the Internet also by electronic equipment, such as television, is increasing. In WWW on the Internet, many useful information is provided, for example in use at homes, such as a race card of television. However, in considering controlling electronic equipment using the information on this Internet reserving video with reference to the race card provided on WWW. After accessing the WWW server which is out of a home by a WWW browser and acquiring the information on a race card etc., the procedure of reserving video using the dedicated software for electronic equipment control is needed. Since [different] it is soft, it becomes complicated operating the dedicated software for the WWW browser used at this time and electronic equipment control.

[0007]Then, this invention enables control of the electronic equipment from apparatus with WWW browsing functions, such as a personal computer and Internet TV, by building a WWW server function in each domestic electronic equipment. Thereby, the user can control domestic electronic equipment now by the same operation method as accessing the Internet. It accesses possible by putting a gateway unit on the interface of the inside of a home, and home outside to the information outside a home, and aims at enabling simple operation by treating the information outside a home, and domestic information with the same operation method.

[0008]

[Means for Solving the Problem]As a means for attaining the above-mentioned purpose, it is going to provide the following electronic equipment and method for controlling the same.

[0009]1. Electronic equipment provided with WWW server function which is electronic equipment which performs operation for which it opted by predetermined operation, and sends out HTML data containing control code which controls the operation, and interface function which performs communication with electronic equipment of the exterior connected to network.

[0010]2. Interface function which performs communication with other electronic equipment which is electronic equipment which performs operation for which it opted by predetermined operation, and is connected to network, A WWW browser function which accesses HTML data which electronic equipment besides this connected above has, Electronic equipment having an input means for operating oneself and other electronic equipment, and a displaying means which displays said HTML data, and operating electronic equipment besides the above.

[0011]3. It is the control method of electronic equipment for controlling by two or more electronic equipment connected by a network mutually, As opposed to the 1st electronic equipment provided with a WWW server function which sends out HTML data containing a control code which controls its operation, A control method of electronic equipment accessing from the 2nd electronic equipment provided with a WWW browser function which accesses these HTML data, and controlling operation of said 1st electronic equipment by said 2nd electronic equipment.

[0012]

[Embodiment of the Invention]One example of electronic equipment of this

invention and a method for controlling the same is described with a drawing. Drawing 1 is a lineblock diagram showing the domestic example of network connection. In the figure, TV2, VTR3, and PC4 are connected in networks, such as LAN, and further, via the gateway unit 1, this network is connected to the public line, in order to transmit and receive the information on the exterior.

[0013]The address decided arbitrarily, respectively is assigned to each electronic equipment 2-4 and the gateway unit 1 in a home. Here, the private address in the IP address currently used on the Internet is used as this address. And the server built in each electronic equipment 2 and 3, It is WWW servers 2a and 3a which have a function which sends out the data written in HTML by HTTP, and the browsers built in each electronic equipment 2 and 4 are WWW browser 2b which has a function which displays the HTML data received by HTTP on a screen, and 4b.

[0014]Here, the example accessed by the electronic equipment 2-4 connected to the network in such a form is explained. In the example shown in drawing 1, there are PC4 and TV2 as apparatus which has WWW browser 2b which can use the Internet in a home, and 4b. And as shown in drawing 2, when specifying the address on the Internet using each WWW browser 2b and 4b and accessing

the WWW server outside a home, Since there is no specified address into a home, the contents of access are received and passed to the gateway unit 1, and delivery of data is performed between the WWW servers outside a home through a public line. At this time, the gateway unit 1 uses a public line and gives a dialup connection to the provider etc. who perform the connection service to the Internet. Thus, access to the usual Internet can be performed.

[0015]As shown in drawing 3, in order to operate VTR3 which is in a home from TV2 or PC4, the address 192.168.10.102 is specified using each WWW browser 2b and 4b. Actually, if VTR3 is specified, it will set up access the address 192.168.10.102 automatically. And VTR3 is accessed via a domestic network and information (user-interface information) required for operation of VTR3 is displayed on WWW browser 2b of an accessing agency, and the screen of 4b from WWW server 3a in VTR3. Similarly, when operating PC4 to TV2, as shown in drawing 4, the address 192.168.10.101 is specified and TV2 is accessed. And user I/F information required for operation of TV2 is displayed from WWW server 2a in TV2 on the screen of WWW browser 4b of PC4 which is an accessing agency. When it accesses from WWW browser 2b built in TV2, WWW server 2a which is in TV2 self without passing along a network will be accessed.

[0016]The example in the case of operating VTR3 here is explained. Drawing 5 is a display screen of TV2 or PC4 at this time, and drawing 6 is a figure showing the transceiver contents of the data between TV2, or PC4 and VTR3. First, if the address 192.168.10.102 is specified from WWW browser 2b of TV2 or PC4, and 4b and VTR3 is accessed, a screen as shown in drawing 5 will be displayed. Namely, if WWW browser 2b and 4b publish a request (demand of page data) to WWW server 3a in VTR3, WWW server 3a in VTR3 sends out the page data for controlling VTR3 written in HTML to this request, and displays it on the screen of TV2 or PC4.

[0017]In the screen shown in drawing 5. That the object to operate is VTR3. The display 31 of the shown operation target, the input of VTR3, or a reproduced image. The reservation-of-picture-recording button 34 which shifts to the reservation-of-picture-recording screen for performing the manual operation button group 33 which performs motion control of VTR3, such as the VTR monitor image 32 to display, recording, playback, and a rapid traverse, and reservation of picture recording, the setting button 35 which shifts to various setting screens, and the counter 36 grade are displayed. And these various buttons 33-35 can be operated with the feeling same with carrying out the direct

control of VTR3 a mouse and by already specifying with the remote control etc. For example like [the request to this VTR3 / of GET http://192.168.10.102/index.html HTTP/1.0], As for the data and 192.168.10.102/for which GET shows that the data request method of an HTTP protocol and http:// are HTTP protocols, an address and index.html show protocol versions, as for a data format, HTTP/1.0.

[0018]In drawing 5, the picture which VTR is outputting to the VTR monitor image 32 now is displayed, and the manual operation button groups 33, 34, and 35 which control VTR to the bottom of it are displayed. And the VTR monitor image 32 shows the false animation using the method of transmitting continuously the still picture compressed by GIF or JPEG from VTR3 used as a server. By the case where the method of the video transmission by procedures other than HTTP is supported on the network, or the usual video cable, when transmission of the animation between apparatus is possible, Since it becomes possible to display the animation of VTR3 as it is, as shown in drawing 7, it can be considered as a system with more sufficient operativity by displaying the animation from VTR3 on the whole screen, and carrying out a superimposed display on an animation by using other information as the browser picture 37.

[0019]And if the user who is using WWW browser 2b and 4b to the manual operation button groups 33, 34, and 35 operates it using the input means of a mouse etc., as shown in drawing 8, the contents of operation which this user performed will be sent out to WWW server 3a of VTR3. WWW server 3a of VTR3 receives the operation which the user performed, and in order to perform these contents of operation, it controls the mechanism of VTR3. And the result of having operated it is replied to TV2 or PC4, and it is made to display on a screen.

[0020]Although the POST method (data is passed) of HTTP, etc. are used here as a method of telling a user's contents of operation to WWW server 3a of VTR3, In this case, since new page data is sent out from WWW server 3a of VTR3 to WWW browser 2b and 4b as a result of POST, the whole screen of WWW browser 2b and 4b is redrawn. In order to avoid this redraw and to realize an interaction with a further more advanced user, The program by Java etc. which can be performed on WWW browser 2b and 4b is beforehand incorporated into page data, and it may be made to tell a user's operation by this to WWW server 3a.

[0021]Next, the case where reservation of picture recording of TV2 or PC4 to VTR3 is performed is explained. In the operation screen shown in drawing 5 or

drawing 7, selection of the reservation-of-picture-recording button 34 will display a screen as shown in drawing 9 on TV2 or PC4. And this screen can perform reserving operation of VTR3. Drawing 9 is a screen for performing reservation of picture recording of VTR3, the title display 34a which shows that it is a request-to-print-out-files screen of VTR3 is in the upper part of a screen, and the list 34b of the requests to print out files already performed to the bottom of it is displayed. A new request to print out files can be added by displaying the field 34d for inputting a request to print out files newly on the lower part, inputting the date of a recording start, video recording start time and finish time, and a recording channel into this field 34d, and choosing the button 34e of a new request to print out files.

[0022]And at the left end of the list 34b of the requests to print out files already performed. There is the radio button 34c for every (each line) request to print out files, and a user can delete the request to print out files by choosing the button 34f of request-to-print-out-files release, after choosing the radio button 34c of a line with which the reservation content which became unnecessary is displayed.

[0023]The example which operates TV2 by PC4 is explained. When the address 192.168.10.101 of TV2 is specified from WWW browser 4b of PC4, the screen

shown in drawing 10 is displayed on PC4. The TV monitor image 22 which displays the display 21 of the operation target which shows that the object to operate is TV like the operation instances of above-mentioned VTR3, reception of TV2, or an inputted image, the channel button 23, the channel manual operation button 24, and the volume control button 25 grade are displayed. And TV2 can be operated with the feeling same with carrying out a direct control by specifying these various buttons 23-25 with a mouse or the remote control.

[0024]And although the TV monitor image 22 shows the false animation using the method of transmitting continuously the still picture compressed by GIF or JPEG from TV2 used as a server, When connected with the video output of TV2 by the case where the method of the video transmission by procedures other than HTTP is supported on the network, or the usual video cable etc., When transmission of an animation is possible, it can be considered as a system with more sufficient operativity by displaying the animation from TV2 on the whole screen as it is, and carrying out a superimposed display on an animation by using other information as a browser picture.

[0025]In drawing 10, the TV monitor image 22 and the operation screen same in the right half as the remote control of TV2 are displayed on the left half of the

screen of PC4. And in order to display this screen and to operate PC4 to TV2, when PC4 to TV2 is accessed, delivery of data as shown in drawing 11 is performed like the case of VTR3 mentioned above. That is, WWW browser 4b publishes a request (demand of page data) to WWW server 2a in TV2, and WWW server 2a in TV2 sends out the page data for controlling TV2 written in HTML to this request, and it displays it on the screen of PC4.

[0026]When WWW server 2a in TV2 is accessed from WWW browser 2b in TV2, as shown in drawing 12, delivery of the same data as the case where it carries out from PC4 is performed within TV2. The screen which shows drawing 10 also at this time is displayed on TV2. And when a user operates each buttons 23-25 of the navigational panel in the right half of the screen shown in drawing 10 using input devices, such as a mouse, As shown in drawing 13, it is sent out to WWW server 2a of TV2 like the case where the contents of operation are VTR3, using the POST method of an HTTP protocol, etc. By controlling the hardware of TV2, WWW server 2a performs operation corresponding to the contents of operation, such as change of a channel and control of volume. When TV2 has accessed its own WWW server 2a with its own WWW browser 2b, as shown in drawing 14, information will flow only into TV2, without going via a network. And the video

which TV2 received at this time projects on a screen as it is, and an operation screen is displayed by a right half or superimposition.

[0027]Here, the example of composition of WWW server 2a in TV2 is shown in drawing 15, and it explains below. The network interface 51 in which WWW server 2a shown in the figure performs communication with a WWW browser, The HTTP treating part 52 which sends out the page data which was connected to this network interface 51, received the request from a WWW browser, and was written in HTML, The page data accumulation part 53 holding the contents of the page data for controlling TV2 by a WWW browser, TV operation reception part 54 which receives the operation and actually controls the hardware 56 of TV2 when a user operates TV2 via a WWW browser, The TV picture data supplied from the TV hardware 56 is captured (it accumulates temporarily), and it changes into still picture data, such as GIF/JPEG, and comprises the TV picture encoder 55 outputted to the HTTP treating part 52.

[0028]In WWW server 2a of such composition, if the network interface 51 receives the request from a WWW browser, the request will be passed to the HTTP treating part 52. In the HTTP treating part 52, page data is received from the page data accumulation part 53, and still picture data is received from the TV

picture encoder 55, and it incorporates into page data, and outputs to the network interface 51. And the network interface 51 is outputting page data as shown in drawing 10 at a WWW browser with a request. When operation of TV2 is performed by the WWW browser side, the contents of operation are supplied to the HTTP treating part 52 via the network interface 51, and are outputted to TV operation reception part 54 as a TV operation request. In TV operation reception part 54, the contents by which TV operation request was carried out to the TV hardware 56 are operated, and the result is outputted to the HTTP treating part 52. And the processing result is outputted to the WWW browser side via the network interface 51.

[0029]The example of composition of WWW server 3a in VTR3 is shown in drawing 16. The network interface 61 in which WWW server 3a shown in the figure performs communication with a WWW browser, The HTTP treating part 62 which sends out the page data which was connected to this network interface 61, received the request from a WWW browser, and was written in HTML, The page data accumulation part 63 holding the contents of the page data for controlling VTR3 by a WWW browser, The VTR operation reception part 64 which receives the operation and actually controls the hardware 66 of VTR3 when a user

operates VTR3 via a WWW browser, Capture the image data supplied from the VTR hardware 66 (it accumulates temporarily), and it changes into still picture data, such as GIF/JPEG, It comprises the TV picture encoder 65 outputted to the HTTP treating part 62, the reservation acceptance part 67 which performs reservation of picture recording, the reservation data base 68 holding the reserved contents, and the page data generating part 69 which creates page data during reservation-of-picture-recording setting out.

[0030]And in WWW server 3a of such composition, if the network interface 61 receives the request from a WWW browser, the request will be passed to the HTTP treating part 62. In the HTTP treating part 62, according to the contents of the request, page data is received from the page data accumulation part 63, and still picture data is received from the image encoder 65, and it incorporates into page data, and outputs to the network interface 61. And the network interface 61 is outputting page data as shown in drawing 5 or drawing 7 at a WWW browser with a request.

[0031]When operation of VTR3 is performed by the WWW browser side, the contents of operation are supplied to the HTTP treating part 62 via the network interface 61, and are outputted to the VTR operation reception part 64 as a VTR

operation request. In the VTR operation reception part 64, the contents by which the VTR operation request was carried out to the VTR hardware 66 are operated, and the result is outputted to the HTTP treating part 62. And the processing result is outputted to the WWW browser side via the network interface 61. In the state where drawing 5 or drawing 7 is displayed on the screen by the side of a WWW browser, if the reservation-of-picture-recording button 34 is chosen, the contents will be supplied to the HTTP treating part 62 via the network interface 61, and will be outputted to the page data generating part 69. In the page data generating part 69, with reference to the reservation data base 68, page data as shown in drawing 9 in which the present reservation content is shown is generated, and it sends out to the HTTP treating part 62. And it is outputted to the WWW browser side via the network interface 61.

[0032]Then, when time and a channel are entered in the request-to-print-out-files field 34d on the screen shown in drawing 9 and the new reservation button 34e is chosen, the contents are supplied to the HTTP treating part 62 via the network interface 61, and are outputted to the reservation acceptance part 67. In the reservation acceptance part 67, the contents are written in the reservation data base 68, and a reservation data base is updated. When deleting a reservation

content, it carries out similarly. And if renewal of a database is completed and the information is outputted to the HTTP treating part 62, the HTTP treating part 62 will require the page data which shows a new reservation content to the page data generating part 69. In the page data generating part 69, with reference to the reservation data base 68, the page data in which a new reservation content is shown is generated, and it sends out to the HTTP treating part 62. And it outputs to the WWW browser side via the network interface 61.

[0033]Finally the composition of WWW browser 2b with which TV2 is equipped is shown in drawing 17, and it explains below. The network interface 71 in which WWW browser 2b shown in the figure performs communication with a WWW server, The HTTP treating part 72 which is connected to this network interface 71 and receives page data and the image data from a WWW server, The HTML treating part 73 which changes the page data supplied into an indicative data, The animation decoder 74 which changes the image data supplied into video (false video) data, It comprises the superimposing part 75 which superimposes the indicative data supplied from the HTML treating part 73, and the dynamic image data supplied from the animation decoder 74, and is outputted to the indicator 76.

[0034]And if the final controlling element 77 is operated in WWW browser 2b of such composition in order that a user may operate for example, VTR3, The manipulate signal is supplied to the HTTP treating part 72 via the HTML treating part 72, is changed by an HTTP protocol, and is outputted to WWW server 3a of VTR3 as a request signal via the network interface 71. If the page data and the image data to a request signal are supplied via the network interface 71 from WWW server 3a of VTR3, Image data is supplied to the animation decoder 74 via the HTTP treating part 72, and is changed into a video signal, and page data is supplied to the HTML treating part 72, and is changed into a browser indicative data.

[0035]A video signal and a browser indicative data superimpose by the superimposing part 75, and are outputted and displayed on the indicator 76. When image data is transmitted not by an HTTP protocol but by other methods and is supplied, the animation decoder 74 is directly supplied from the network interface 71. And in this case, the animation decoder 74 changes the video data inputted into a video signal, and is outputting it.

[0036]As explained above, since electronic equipment and a method for controlling the same of this invention can control other electronic equipment

which is the feeling which accesses the Internet and looks at the homepage outside a home, and is in a home, they can operate anyone easily. Operation using the information by the homepage outside a home can also be performed easily. And since the addresses to which each electronic equipment is connected differ even when two or more the same kind of electronic equipment, such as two sets of VTRs etc., is connected, it can be operated individually.

[0037]Since addresses only increase in number even if electronic equipment increases, it can respond easily. And since the information about a new function is supplied to other electronic equipment as page data from the WWW server built in the electronic equipment added newly even when the electronic equipment which will have a new function in the future is connected, It becomes possible to operate it from the electronic equipment which has the WWW browser function connected now.

[0038]

[Effect of the Invention]According to electronic equipment and a method for controlling the same of this invention, operation can be carried out from other electronic equipment by the same method as accessing the Internet to the domestic electronic equipment which built in the WWW server function. Control

of the electronic equipment which built in the WWW server function is easily controllable by the electronic equipment which built in the WWW browser function. It is effective in the ability to respond even if the same kind of electronic equipment and the new electronic equipment which was not until now are added.

[Translation done.]